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PROSPECTUS

OF THE

PICTOU

CHARCOAL IRON CO.

(LIMITED.)

First Issue of $50,000 8 Per Cent. Preferred Stock.

500 SHARES AT $100 EACH.

NOVEMBER, 1891.

A
622.34
P58

First Issue of $50,000 eight per cent. Preferred Stock of the PICTOU CHARCOAL IRON COMPANY, Lt'd, in 500 shares of $100 each, ranking before the ordinary shares, as regards Dividend, and becoming cumulative after July 1st, 1892.

Any of the Directors of this Company is authorized to receive applications for the above Preferred Stock, such application to be made on the annexed form, and accompanied by a deposit of 10 per cent of the amount applied for.

Future calls will be made at such times as the Directors may deem proper; but in all cases not less than 21 days previous notice shall be given to the Shareholders of a call having been made, and no instalment shall exceed $10 per share.

PICTOU CHARCOAL IRON COMPANY,

LIMITED.

Incorporated by Royal Letters Patent under the Nova Scotia Joint Stock Companies' Act, in 1891.

CAPITAL STOCK, - $200,000,

——DIVIDED INTO——

1000 Ordinary Shares of - - - $100 each,

——AND——

1000 Preferential Shares of - - $100 each.

DIRECTORS:

WM. B. MOORE, - Fuel Inspector I. C. R., New Glasgow, N. S.
ALFRED MARKHAM, - Manager "Daily Sun," St. John, N. B.
J. N. W. WINSLOW, - - - - Barrister, Woodstock, N. B.
D. R. GRANT, - Station Agent I. C. R., New Glasgow, N. S.
ERNST A. SJOSTEDT, - Chemist and Metallurgical Engineer.

PRESIDENT: - - - - - - - W. B. MOORE.
SECRETARY AND TREASURER: - - D. R. GRANT.
GENERAL MANAGER: - - - ERNST A. SJOSTEDT.

Offices: New Glasgow and Bridgeville, N. S.

THE PICTOU CHARCOAL IRON COMPANY (Limited) has been incorporated by Royal Letters Patent under the Nova Scotia Joint Stock Companies' Act, for the purpose of manufacturing charcoal pig iron, on the East River of Pictou, Pictou County, Nova Scotia, and to transact any other business in connection with, and incidental to, such manufacture.

The organizers have subscribed to all the ordinary stock, part of the proceeds of which has been used in purchasing the following rights and properties, and the balance to be expended at once towards the erection of a blast furnace, with all necessary buildings and machinery, on their property at Bridgeville, Pictou County, N. S.

In order to provide funds to further carry out the objects of the Company, $50,000 of the 8 per cent. preferred stock, in 500 shares of $100 each, are hereby offered for subscription; which will leave $50,000 of capital still unissued and available for the future.

ORE.—The Company now control a very large and valuable deposit of the highest grade of brown hematite on the Grant farm, at Bridgeville; also other valuable ore deposits in the near vicinity.

LIMESTONE AND MANGANESE ORE for Fluxes are also found on the Grant farm and neighborhood in abundance.

WOOD, for charcoal manufacture, is owned by the Company, over 3500 acres of heavy old-growth hardwood land, within 15 miles of the furnace site, having been bought; besides which the country, all along the East River Railway and the I. C. R., is heavily wooded, and this wood can also be obtained at low cost for charcoal manufacture.

FURNACE SITE has been bought, comprising 11½ acres, on the Grant farm, and immediately on the new line of railroad being built by the New Glasgow Iron, Coal & Railway Company, as also on the projected Nova Scotia Midland Railway from New Glasgow to the Atlantic.

All further information is given in the annexed Report of the Company's manager, in which the advantages and prospects of the enterprise are fully set out:—

REPORT

ON THE

Advantages of Manufacturing Charcoal Pig Iron,

ON THE EAST RIVER OF PICTOU, PICTOU CO., N. S.,

BY ERNST A. SJOSTEDT,

CHEMICAL AND METALLURGICAL ENGINEER.

The total amount of manufactured cast and wrought iron consumed in the Dominion of Canada in 1889 has been estimated to be about 250,000 tons, including 117,212 gross tons of imported steel rails. In order to supply this demand about 75,000 tons of pig iron were used, of which about 50,000 tons were imported; and in 1888 only 18,191 tons of pig iron were produced in the country.

Surprise is often expressed that with its mineral wealth, and with this large demand for iron, Canada has produced so little of this important metal; but an examination of the records shows that a large amount of money has been expended for the development of its iron resources, which as a rule has given unsatisfactory returns. Such a history has naturally a demoralizing effect upon investors, who see results only and fail to seek for causes.*

In a paper by J. H. Bartlett of Montreal, at the Halifax meeting of the Am. Institute of Mining Engineers, the various attempts to manufacture iron in Canada were reviewed, and the possibility of achieving success strongly presented. Mr. Bartlett justly claims that much of the discredit which has come upon investments in the production or manufacture of iron in the Dominion is due to the facility with which money was placed in so-called "improved processes," heralded as short cuts to metallurgical success.* "A variety of experiments have been made, which are counted as failures in the iron manufacture, bringing unwarranted discredit upon the industry. The experiments in many cases were costly, and were undertaken by patentees of all kinds, of no standing or experience in the trade."

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* John Birkinbine, Engineer, Sec'y U. S. Ass'n. of Charcoal Iron Workers. Vide Trans. Am. Inst. of Mining Engineers, Vol. XII.

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It is only within the last decade that iron received any protection from the Dominion Government, which protection amounted to but $2.00 per ton until July 1st, 1883, when a special bounty of $1.50 per ton for iron made in the Dominion from Canada ores was granted by the Government, and which bounty now is reduced to $1.00 per ton. But in 1887 the duty on pig iron imported into this country was increased to $4.00 per net ton, and a law was passed this year at Ottawa to increase the bonus for five years to $2.00 per net ton to take effect July 1st, 1892. The domestic metal, therefore, will be protected to the amount of $6 per net ton, or $6.72 per gross ton.

Coke iron is at present made only by the Londonderry Iron Co., at Londonderry, N. S.; but two other companies are formed at New Glasgow (the New Glasgow Iron Coal & Ry. Co., and the N. S. Midland Ry. & Iron Co.), with a view of building railroads to the East River of Pictou ore beds, and to erect coke furnaces—in consequence of which the market for this kind of iron soon will be supplied.

Charcoal iron, too, is made in Canada in only one place, and this on a limited scale (namely by McDougall & Co. at Drummondsville, P. Q.); and it is estimated that 15,000 tons of this grade were imported last year. The greatest part of this importation was used in the manufacture of car wheels, for which, as is known, only a specially strong and superior iron will be accepted; and owing to the very extensive railroad systems now completed and under construction in this vast country, (at present including ever 10,000 miles,) it is evident that the demand for this special grade of iron is on the increase, and no doubt will soon assume important proportions.*

At present the iron needed in the manufacture of car wheels is imported from the United States, and the present prices paid for the best grade in St. John, for instance, by the J. Harris & Co. (car builders) is as high as $30, depending partly on the long haul from the furnaces, partly also on the increased duty imposed on pig iron imported into the Dominion (as stated above.)

Now the question naturally arises: why cannot this deficiency be made up here, and the iron manufactured *at home?* or which is equivalent, is there here any place, near lines of transportation, where the three essential factors of an industry of this kind are present in sufficiently large quantities to guarantee a successful and continuous business?

The "three things needed" for the profitable production of charcoal iron are—1st, *rich and pure ores*,
2nd, *suitable fluxes*, and
3rd, *plenty of hard wood.*

In order to ascertain these facts quite an extensive prospecting tour was made, last summer, by the writer, during which all the known iron ore deposits in Nova Scotia and New Brunswick were examined,

* For the sake of comparison it may be instructive to mention here that the U. S., with a population of about ten times that of Canada, produced in 1889 8,517,068 net tons of iron (including 644,300 tons charcoal iron), or about 500 times as much as Canada.

and analysis made from the samples collected, and the results of said investigation go to prove that (although several other important deposits were met with) no place can in every and all respects show such advantages for a charcoal iron industry, on a large scale, as the locality along the East River of Pictou, in Pictou County, Nova Scotia.

Here, beginning at Springville (about 10 miles S. of New Glasgow) and following the line of junction of the Upper Silurian strata, and the Lower Carboniferous Limestones, close to and parallel with the East Branch of East River, for a distance of six miles, to Sunny Brae, we find outcrops of deposits of rich *brown hematites* (limonites), in places several hundred feet wide, and of a depth of a few to a couple of hundred feet, and only interrupted here and there by deposits of a more or less pure limestone, and beds of ankerite. And being on a hillside, at an elevation above the valley below of a few hundred feet, the mining is rendered especially easy. Several prospecting shafts have here been sunk, in one place to a depth of 200 to 300 feet in the ore, and a truly wonderful outcrop is seen on the Grant farm at Bridgeville, and at Black Rock, near Sunny Brae.

The ores are compact and fibrous, and the several analysis hereby annexed prove them to be of exceptional richness, and some of them also of great purity:

	Large average, by E.Gilpin	By Huxley.	Wm. Brooks, (McCullen.)	New Glasgow Steel Co.	Grant's Ore, by E. A Sjostedt
Silica	3 00	4.25	5.83	3.40	2.25
Alumina	Trace.	.71	1.02	1.42	.....
Binoxide of Manganese	Trace.	20	.0*	.....	.....
Lime	.50	.....	.31	.29	.....
Magnesia			.05	.....	.....
Water	7 70	13.60	9.46	10.52	10.10
Metallic Iron	65 54	56.83	57.71	58 38	60.56
Sulphur	Trace.	Trace.	.05	.04	.06
Phosphorus	Trace.	.07	.43	.15	.27

Beginning at Sunny Brae, on the south side of the river, and taking a nearly easterly course, we now encounter an equally remarkable body of ore, extending nearly continually over seven miles in length, also over an elevated ground (on what is known as the Weaver and Watson properties), and showing a mineral belt of about 100 feet wide carrying several veins of *specular* ore, from a foot to 15 feet thick. It is of a compact and foliated character, and of a remarkable richness, as will be seen from the following published analysis:—

	Weaver Ore.		Watson.
Insoluble matter	3.89	3.20	3.40
Metallic Iron	64.41	68.33	65.60
Sulphur	.10	Trace	.68
Phosphorous	.035	None	Trace

These ore deposits seem to have long been known, and were described in an exhaustive paper by Mines Inspector Gilpin, presented to the Am. Inst. of Mining Engineers at their Chattanooga meeting (May 1885). But owing to the absence of railroads out to the above described ore beds, no extensive mining has been done, and these inexhaustible deposits of valuable ores are practically untouched at this present date. The East River Railway, and the projected Nova Scotia Midland railroad, from New Glasgow to Sunny Brae, and to be extended out to the Atlantic coast, will not only make the ores accessible, however, but also be the means of easily bringing the different raw materials to a manufacturing centre, and furnish an outlet for the manufactured iron, both East and West, out to the Intercolonial system of railways, and to deep water harbors at New Glasgow and on the Atlantic.

As for *fluxes*, we have, as already indicated, several large bodies of limestone and ankerite, intersecting the ore beds, and well adapted for furnace use. These, too, have been described by Mines Inspector Gilpin (see Trans. Roy. Soc. Canada, 1886). The following table will suffice to give an intelligent idea of the composition and value of some of the more important ones :—

	SUNNY BRAE Lime.	McLEAN'S near Springville, Lime.		GRANT'S Lime.	CROSS BROOK, near Springville. Lime.	Ankerite.	Ankerite.	SPRINGVILLE. Ankerite.
Silica	8 44	2.10	1.99	2 09	1.86	3.08	.57	8.30
Alumina	....	.12	.10	.52	.51	....		
Carb. Lime	85.77	93.90	96.26	90.66	91.50	58.77	53.69	55.28
" Magnesia	3.56	2.45	2.33	2.36	.46	9.89	21.48	10 15
" Iron	1.17	.59	.57	2.28	2.28	26.81	.70	1.50
Manganese	....	56	.55	....	Trace	1.26	....	17
Sulphur	.63	Trace	Trace	.42	.52	.12	....	17
Phosphorous	.167	.013	.013	.056	.087	....	....	None.
Water	....	.18	.17	1.11	1.25	.12	....	....
Metallic Iron	....		....	....	....	....	11.32	11.64

The *fuel* necessary for the industry in question being charcoal, we will now consider what materials we have at hand to manufacture it of. The county of Pictou is literally covered with hard wood forests, and cord wood for charcoal making could, therefore, be delivered at the track of the Intercolonial Railway, and the East River Railway, at a very low price, (it having no commercial value here outside of "fire wood"); besides which the N. S. Midland Ry., when completed, will make accessible and useful thousands of acres of old growth hard wood, (black birch, beech and maple, that measure up to two feet and over in diameter,) and which would yield a cheap and very strong charcoal. Outside of the wood and charcoal, (in event of extra fuel being required for melting and producing gas, in a future extension of the works for

car wheel making, etc.,) we have here, at our very door, the producing coal fields which make a good coke and good fuel gas.

Thus, we have here, at the East River of Pictou, a variety of rich and pure ores, in close proximity to a number of good lime stone beds —both offering special advantages for cheap mining—and, inside of 25 miles, thousands of acres of old-growth hardwood for charcoal making. Add to this the vicinity of the active coal mines, the abundance of water supply from the brooks and the river, and the exceptional facilities for transportation (after the completion of the New Glasgow Iron, Coal & Ry. Co.'s Railway, and the N. S. Midland Ry. now under construction)—and we have every and all of the conditions required for an industry of this kind on a large and profitable scale.

With a view of establishing a charcoal iron plant in the heart of this mineral centre sufficient hardwood land has been bought, mining rights for ore and lime rock secured, and a suitable site for the furnace plant purchased at Bridgeville.

Locating the works here, the furnace materials would cost, delivered at the furnace, about as follows:—

One ton of ore, mining expenses	$1.00
" " " royalty	.25
" " " roasting and loss	.30
" " " freight to furnace	.25
Total cost per ton ore at the furnace	$1.80

One cord of wood, cutting,	$0.65
" " " stumpage	.10
" " " hauling to carbonization works	.75
Total cost per cord, delivered at Ry. track	$1.50

On the basis of 45 bushels of charcoal to the cord of wood,

One bushel charcoal will cost, for wood,	3.3 cts.
" " " " " carbonization,	1.0 "
" " " " " loading on cars,	0.2 "
" " " " " freight to furnace,	0.5 "
" " " " " interest and depreciation on plant,	0.1 "
" " " " " waste and breakage,	0.2 "
Total cost per bushel of charcoal at furnace,	5.3 cts.

The lime rock should not exceed, for mining, per ton,	$0.40
" " " " " " " royalty " "	.10
" " " " " " " freight " "	.25
Total cost per ton lime rock delivered at furnace,	$0.75

And, although the ores in question show a yield of nearly 60% metallic iron in their raw state, and after roasting would gain about 8% more, and thus would be likely to average from 60% to 65% in the blast furnace, we will in our estimate, in order to be on the safe side, only count on 50%. For the same reason we will also base our cost of charcoal at 5.5 cents per bushel.

The cost of producing one ton of pig iron here (in a 6,000 tons furnace) would be as follows:—

2 tons of 50% ore @ $1.80		$3.60
110 bushels of charcoal, @ 5.5 cts.,		6.05
¼ ton of lime stone, @ 75 cts.,		.19
Labor at furnance,		1.25
Furnace running expenses,		.25
Repairs,		.50
Office and superintendence,		1.00
Incidentals and depreciation of plant,		.41
Total cost per ton pig iron,		$13.25
Estimated selling price delivered,	$25.00	
Cost of manufacture,	$13.25	
Allow for sales and loss,	.60	
" " freight,	2.40	
Total cost delivered,	$16.25	
Less Government bonus,	2.24	2.24
Net cost per ton,	$14.01	$11.01
or a profit, per ton, of	10.99	$25.00

With a profit of $10.00, and an output at the furnace of only 5,000 tons per annum (less than 15 tons per day) the annual gain would be $50,000.00.

A well equipped blast furnace plant of 25 tons daily capacity (say 8,000 tons annually) would cost about $80,000.00; and the amount of capital required for its erection and running would be about $100,000.00 exclusive of ground, mining rights and hardwood land.

ERNST A. SJOSTEDT,
E. M.

Woodstock, N. B., Dec., 1890.

APPENDIX I.

ABSTRACTS FROM THE NEW GLASGOW IRON, COAL AND RAILWAY CO.'S REPORT ON THE EAST RIVER ORES, AND REGARDING THE "GRANT FARM MINE," (LEASED BY THE WRITER).

(1)

"The Grant farm has the best display of solid limonite of any portion of the contact; on the top of the hill 15 feet solid pure limonite, that is 58 per cent. metallic was opened so solid and pure as to need blasting, requiring no preparation whatever for the furnace. This ore was worked by an open cut Below this again a tunnel 60 feet in length is driven to the vein which opens out 5 feet at once, showing much the same character of ore. At the foot of the hill a tunnel has been commenced and the ground opened out 200 feet, the last 30 feet being in the ore; this can be used for an adit level, and there will be upward of 300 feet on the incline below outcrop. *Much importance must be attached to this property.* The lump ore is used in rolling mill for fettling purposes.

"After a full and careful examination of the different properties made on the ground, and a minute inspection of the whole field, I am fully persuaded that nowhere in the world are there better facilities for the production of iron than on the East River, Pictou, N. S, and that nowhere on the American Continent can iron be produced at so low a cost.

"The Canadian market offers an opening unknown elsewhere: a largely increasing consumption, a handsome bonus given on every ton of ore produced, by a most liberal government, are certainly unusual financial inducements.

G. F. RENDALL, M. E.

New York, Sept. 25, 1890.

(2)

"Hematite from Grant's farm:

Silicious matter,	5.88
Metallic Iron,	56.57
Phosphorous	.213
Sulphur,	.096
Water,	10.90 "

"This solid bed of hematite is non-bessemer. Under certain conditions this particular ore will have advantages over the others for foundry purposes, the phosphorous being desirable on account of its tendency to make the iron flow and fill the moulds better. The best Alabama foundry iron carries about 4 per cent. phosphorous, just like the pig iron from the Grant ore would possess.

"In all respects the analysis shows up excellently and by far better than any ore we have seen or heard of in the southern part of the United States, or in fact, better, considering that it represents a solid bed. than any hematite deposit in any part of the world, as far as our knowledge goes.

Philadelphia, Pa., Nov., 1890. STEIN & SCHWARTZ,
Engineers and Chemists.

APPENDIX II.

ABSTRACTS FROM WRITERS ON THE EAST RIVER OF PICTOU ORE BEDS.

E. Gilpin, Jr., Chief Inspector of Mines, N. S.:—

"Here alone in the Dominion do the ores, the fuel and the fluxes occur in that juxtaposition which is indispensable to the economical production of pig iron, and the innumerable industries directly occupied in its conversion into manufactured iron and steel." (1890).

"And considering the wooded condition of nearly all the Silurian and Cambro-Silurian districts and the little inducement that has as yet existed to stimulate search, it must be admitted that the discoveries hitherto made, almost exclusively of natural exposure, are of good promise." (1885)

"Limestone is abundant in the county, and forms an irregular band between the iron ores and the coal fields. On the East River it is at several places close to the iron ore. The higher beds are frequently very pure and uniform in quality. They vary in thickness up to 75 feet, and are often continuous for long distances." (1885).

"Although this locality in many respects is adapted for iron smelting, etc., no attempts have yet been made to begin the work, Nova Scotia capital is more readily turned to lumbering, fishing and shipping ventures, and such an investment appears equally foreign to the rest of the Dominion." (1885).

Dr. Harrison of the Geological Survey, wrote in 1874 :—

"It is to be hoped also that something will soon be done towards developing the valuable deposits of iron ore in Pictou County. Here the ores are abundant and of varied character, they are near to the Pictou coal fields, whence coal suitable for the manufacture of coke could be obtained from a number of the mines now in active operation. Limestone suitable for a flux occurs abundantly in the valley of the East River, the provincial railway passes through the coal fields and within a few miles of the ore deposits, and the harbor of Pictou affords an excellent port of shipment during six months of the year."

Sir W. E. Logan, in his report on the Pictou coal and ore fields of the Geological Survey of the Dominion of Canada for 1867–69, writes of the Fraser area :—

Numerous boulders of a very pure variety of limonite have been found in the vicinity of Springville on the East River, but so far as I can learn, the ore had not been found in place until Oct. 15th, 1868, when a bed was discovered on James Fraser's land, about $1\frac{3}{4}$ miles above Springville, by Mr. A. P. Ross of Pictou and myself. The only exploration we were enabled to make was a shallow pit, sunk in a few hours by one man, but this was sufficient to explore a mass eight feet in thickness of a pure limonite of the mammillary, stalactities and fibrous variety. The bottom of the bed was not exposed; it was hidden by a high drift bank; neither was the deposit traced for any distance on the strike. Should it prove to be a persistent bed, it would be a most valuable deposit, as the ore is one of the purest known. No substance, save the pure mineral, was discovered in the bed, the roof appearing well defined :—

Metallic iron, 59.46 %; Combined water, 15.43; Silica, 0.41%.

"Charter Members."

Ernst A. Sjostedt,	New Glasgow, N. S.
Will B. Moore,	New Glasgow, N. S.
Alfred Markham,	St. John, N. B.
J. N. W. Winslow,	Woodstock, N. B.
Daniel R. Grant,	New Glasgow, N. S.
J. T. A. Dibblee,	Woodstock, N. B.
Arthur F. Garden,	Woodstock, N. B.
J. Albert Grant,	Bridgeville, N. S.
James W. Grant,	Bridgeville, N. S.
Daniel McDearmid,	New Glasgow, N. S.
John McDonald,	New Glasgow, N. S.
John McGillivray,	New Glasgow, N. S.
Daniel McGregor,	New Glasgow, N. S.
J. Forster,	Dorchester, N. B.
A. J. Markham,	St. John, N. B.

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